

## REMARKS

Claims 38, 40-49, and 51-75 are pending in this application. Claims 1-37 were previously withdrawn, and claims 39 and 50 are canceled herein. Claims 38, 40-43, 51, 52, 64-66, and 69-70 have been amended herein. In view of these amendments and remarks, Applicants respectfully request reconsideration of the claims.

### **I. AMENDMENTS**

Applicants amended claim 38 to incorporate the limitations of claim 39. No new matter was added.

Applicants amended claims 40-43 to read, “... the pH of the immersion fluid is between ...” some specified number “and about 7.” Applicants also amended claims 64-66 to read a range from a specified number to “about 7.” Support for these amendments can be found at least at paragraph [0034]. Thus, no new matter was added.

Claims 51, 52, 69, and 70 were amended to correct the word “fluoride” to “fluorine,” as suggested by the Examiner. Because fluorine is the known substance that is used to create the solutions, such aqueous hydrogen fluoride, sodium fluoride, and the like, no new matter was added. Additionally, claim 52 was amended to correct the terminology for close-ended *Markush* groups. Again, no new matter was added.

### **II. REJECTIONS UNDER 35 U.S.C. § 112**

Claims 38-62, 64-66, and 68-70 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claims the subject matter which Applicants regard as the invention.

***A. Claims 38-47 and 64-66***

The Examiner asserts that claims 38-47 and 64-66 are indefinite because claims 39-43 and 64-66 allegedly “do not further limit” the range provided in independent claim 38. Office Action, p. 2. Applicants have amended claims 38, 40-43 and claims 64-66 to more clearly define the claimed invention. Independent claims 38, as amended, and 63 define an immersion fluid comprising water “having a pH of less than 7 ....” Because the pH scale operates on a known range between 0 and 14, defining an immersion fluid having a pH of less than 7 defines a range of pH between 0 and about 7. Claims 40-43 and 64-66 each further limit the range of this immersion fluid or water to between 2 and about 7, to between 4 and about 7, to between 5 and about 7, and to between 6 and about 7. For example, dependent claims 42 and 65, which require a range between 5 and about 7, do not, by definition, include a pH from 0 to about 5, which are included in the range defined in the independent claims 38 and 63. Therefore, the dependent claims do further limit the independent claim limitations. Similarly, claims 44-47 each define chemical compositions (i.e., the hydrogen ion concentration) for the claimed immersion fluid that correspond to the specifically limited range of pH values. Thus, here as well, each of claims 44-47 further limit the broader pH range of independent claim 38, as amended. Because claims 40-47 and 64-66 each further limit the range defined in independent claims 38 and 63, these claims are definite, and Applicants respectfully request the Examiner to withdraw the rejections under 112, second paragraph.

***B. Claims 51, 52, 69, and 70***

Applicants have amended claims 51, 52, 69, and 70 to correct the chemical name of “fluorine.” The Examiner is thanked for identifying the incorrect language. Applicants, thus,

respectfully request the Examiner to withdraw the rejections thereto under 112, second paragraph.

***C. Claim 52***

Applicants have amended claim 52, as suggested by the Examiner, to comply with the proper language for closed *Markush* groups. The Examiner is thanked for pointing out this error.

***D. Claims 53-55 and 71***

The Examiner asserts that the open-ended ranges found in claims 53-55 and 71 are indefinite solely due to their open-endedness. However, ranges that are open-ended are not indefinite *per se*. Breadth of a claim is not to be equated with indefiniteness. *In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph. M.P.E.P. § 2173.04. An open-ended range is certainly clear. As noted further in the M.P.E.P., an open-ended range can be indefinite when a dependent claim contradicts or creates an impossible circumstance that obviates the independent claim's range. M.P.E.P. § 2173.05(c). However, the presumption is that the open-ended range in the independent claim is an allowable type of claim. Thus, claims 53-55 and 71 are not indefinite *per se* solely because of their open-endedness. Accordingly, Applicants respectfully request the Examiner to withdraw the rejections thereto.

**III. REJECTIONS UNDER 35 U.S.C. § 102**

Claims 38-47, 57, and 61-66 are rejected under 35 U.S.C. 102(c) as being anticipated by U.S. Patent Publication No. 2006/0154188 to Hirayama (hereinafter "*Hirayama* '188").

To anticipate a claim under 35 U.S.C. § 102, a reference must teach every element of the claim. See *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Id.* Moreover, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

Claim 38, as amended, requires, “introducing an immersion fluid comprising water into a space between an optical surface and the photoresist layer, said immersion fluid having a pH of less than 7 ....” Claim 63 also requires, “introducing water into a space between an optical surface and the photoresist layer said water having a pH of less than 7 ....” *Hirayama* ‘188 defines its immersion fluid “comprising a fluorine-based liquid.” *Hirayama* ‘188, para. [0180]. Water is not a fluorine-based liquid. Moreover, as noted by the Examiner, typical pure or deionized water has a pH of 7, which, contrary to the Examiner’s conclusions, does not fall within the range of any of claims of the present application. “Less than 7” is not equal nor does it correspond to 7. Furthermore, when reconciled to the “less than 7” requirement, “about 7” is also not 7. Therefore, *Hirayama* ‘188 does not teach each and every limitation of claims 38 and 63. Accordingly, claims 38 and 63 are allowable for at least the reasons discussed above. Applicants, therefore, respectfully request that the rejections of claims 38 and 63 be withdrawn.

Claims 40-47, 57, and 61-66 depend from claims 38 and 63, respectively and, thus, inherit all of the limitations of their respective base claims. Accordingly, claims 40-47, 57, and 61-66 are allowable for at least the reasons discussed above. Applicants, therefore, respectfully request that the rejections of claims 38, 40-47, 57, and 61-66 likewise be withdrawn.

#### IV. REJECTIONS UNDER 35 U.S.C. § 103

In *Graham v. John Deere Co. of Kansas City*, the Supreme Court set out a framework for applying the statutory language of §103. 383 U.S. 1 (1966). The Court stated:

Under 35 U.S.C. §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. *Id.*, at 17–18.

The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. *KSR Int’l Co., v. Teleflex, Inc.*, 550 U.S. \_\_\_\_\_ (2007).

Patents for obvious combinations must generally be disallowed because a “patent for a combination which only unites old elements with no change in their respective functions . . . obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men.” *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U. S. 147, 152 (1950). However, when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious. *United States v. Adams*, 383 U. S. 39, 51-52 (1966). Moreover, no holding or doctrine diminishes the necessity of the combined teachings or obvious elements teaching or suggesting each and every limitation of the claimed invention.

***A. Claims 48-50, 67, and 68***

Claims 48-50, 67, and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Hirayama* '188 in view of U.S. Patent Publication No. 2004/0175647 to French (hereinafter "*French*").

The Examiner admits that *Hirayama* '188 does not teach that the optical surface can be silicon dioxide or calcium fluoride. Office Action, p. 5. The Examiner offers *French* to cure these deficiencies. However, as noted above, *Hirayama* '188 does not teach an immersion fluid comprising water with a pH less than 7, as required by claims 38 and 63. Claims 48, 49, 67, and 68 each depend from claims 38 and 63, respectively, and, thus, inherit each limitation of their respective base claims. The Examiner does not offer *French* to cure this deficiency, nor does *French* teach such limitations. Therefore, the combination of *Hirayama* '188 and *French* do not teach or suggest each and every limitation of the claimed invention. Accordingly, claims 48, 49, 67, and 68 are allowable for at least the reasons discussed above. Applicants, therefore, respectfully request that the rejections of claims 48, 49, 67, and 68 likewise be withdrawn.

***B. Claims 56 and 72***

Claims 56 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Hirayama* '188 in view of U. S. Patent Publication No. 2006/0154171 to Hirayama (hereinafter "*Hirayama* '171").

The Examiner admits that *Hirayama* '188 does not teach that a chemically amplified photoresist is used in the immersion lithography process. Office Action, p. 6. The Examiner offers *Hirayama* '171 to cure this deficiency. However, as noted above, *Hirayama* '188 does not teach an immersion fluid comprising water with a pH less than 7, as required by claims 38 and 63. Claims 56 and 72 each depend from claims 38 and 63, respectively, and, thus, inherit each

limitation of their respective base claims. The Examiner does not offer *Hirayama* '171 to cure this deficiency, nor does *Hirayama* '171 teach such limitations. Therefore, the combination of *Hirayama* '188 and *Hirayama* '171 do not teach or suggest each and every limitation of the claimed invention. Accordingly, claims 56 and 72 are allowable for at least the reasons discussed above. Applicants, therefore, respectfully request that the rejections of claims 56 and 72 likewise be withdrawn.

**C. Claims 58-60 and 73-75**

Claims 58-60 and 73-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Hirayama* '188 in view of U.S. Patent Publication No. 2005/0037269 to Levinson (hereinafter "*Levinson*").

The Examiner admits that *Hirayama* '188 does not teach that there is a stage underlying the semiconductor structure and that the stage and the semiconductor are immersed in the immersion fluid. Office Action, p. 7. The Examiner offers *Levinson* to cure this deficiency. However, as noted above, *Hirayama* '188 does not teach an immersion fluid comprising water with a pH less than 7, as required by claims 38 and 63. Claims 58-60 and 73-75 each depend from claims 38 and 63, respectively, and, thus, inherit each limitation of their respective base claims. The Examiner does not offer *Levinson* to cure this deficiency, nor does *Levinson* teach such limitations. Therefore, the combination of *Hirayama* '188 and *Levinson* do not teach or suggest each and every limitation of the claimed invention. Accordingly, claims 58-60 and 73-75 are allowable for at least the reasons discussed above. Applicants, therefore, respectfully request that the rejections of claims 58-60 and 73-75 likewise be withdrawn.

***D. Claims 51-55 and 69-71***

Claims 51-55 and 69-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Hirayama* '188 and *French* as applied to claims 38-50, 57, and 61-68 above, and further in view of U.S. Patent Publication No. 2005/0186513 to Letz (hereinafter "*Letz*").

The Examiner admits that the combination of *Hirayama* '188 and *French* does not teach that a fluorine containing compound can be sodium, potassium, or hydrogen fluoride, and that the concentration of the fluoride ions is greater than 0.01, 0.05, and 0.1 mol/L. Office Action, p. 8. The Examiner offers *Letz* to cure these deficiencies. However, as noted above, *Hirayama* '188 and *French* do not teach an immersion fluid comprising water with a pH less than 7, as required by claims 38 and 63. Claims 51-55 and 69-71 each depend from claims 38 and 63, respectively, and, thus, inherit each limitation of their respective base claims. The Examiner does not offer *Letz* to cure this deficiency, nor does *Letz* teach such limitations. Therefore, the combination of *Hirayama* '188, *French*, and *Letz* does not teach or suggest each and every limitation of the claimed invention. Accordingly, claims 51-55 and 69-71 are allowable for at least the reasons discussed above. Applicants, therefore, respectfully requests that the rejections of claims 51-55 and 69-71 likewise be withdrawn.



Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Thomas J. Meaney, Applicants' attorney, at 972-732-1001, so that such issues may be resolved as expeditiously as possible. No fee is believed due in connection with this filing. However, should one be deemed due, the Commissioner is hereby authorized to charge Deposit Account No. 50-1065.

Respectfully submitted,

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Date

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